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## CLAIMS

## What is claimed is:

- 1. A method for immunizing an individual against infection by vaccinia and/or variola virus, the method comprising inducing an immune response against a polypeptide comprising peptide 74A.
- 2. The method of Claim 1, wherein the polypeptide is selected from the group consisting of MVA189R, Copenhagen B22R, Copenhagen C16L, Bangladesh-1975 D2L, India-1967 D1L, Garcia-1966 B1L, Brighton Red V212 or Zaire-96-I-16 N1R.
- The method of Claim 1, further comprising a second polypeptide comprising peptide 165.
  - 4. The method of Claim 1, wherein the immune response is induced by administering a product selected from the group consisting of a polypeptide, a naked nucleic acid molecule encoding the peptide or a nucleic acid molecule, encoding the peptide, in a suitable vector.
  - 5. A method for immunizing an individual against infection by vaccinia and/or variola virus, the method comprising inducing an immune response against a polypeptide comprising peptide 165.
- 6. The method of Claim 5, wherein the polypeptide is selected from the group consisting of MVA018L, Copenhagen C7L, Tian Tan TC7L, Bangladesh-1975

D11L, India-1967 D8L, Garcia-1966 B14L, Brighton Red V028 or Zaire-96-I-16 D10L.

- 7. The method of Claim 5, further comprising a second polypeptide comprising peptide 74A
- The method of Claim 5, wherein the immune response is induced by administering a product selected from the group consisting of a polypeptide, a naked nucleic acid molecule encoding the peptide or a nucleic acid molecule, encoding the peptide, in a suitable vector.
- A method for immunizing an individual against infection by vaccinia and/or
   variola virus, the method comprising inducing an immune response against a
   polypeptide comprising peptide 74A, immunogenic fragments or mutants
   thereof.
- The method of Claim 9, wherein the polypeptide is selected from the group consisting of MVA189R, Copenhagen B22R, Copenhagen C16L, Bangladesh 1975 D2L, India-1967 D1L, Garcia-1966 B1L, Brighton Red V212 or Zaire-96 I-16 N1R.
  - 11. The method of Claim 9, further comprising a second polypeptide comprising peptide 165, immunogenic fragments or mutants thereof.
- 12. The method of Claim 9, wherein the immune response is induced by
  20 administering a product selected from the group consisting of a polypeptide, a
  naked nucleic acid molecule encoding the peptide or a nucleic acid molecule,
  encoding the peptide, in a suitable vector.

- 13. The method of Claim 9, wherein 1 to about 4 amino acids can be substituted without essentially detracting from the immunological properties of peptide 74A.
- 14. A method for immunizing an individual against infection by vaccinia and/or variola virus, the method comprising inducing an immune response against a polypeptide comprising peptide 165, immunogenic fragments or mutants thereof.
- The method of Claim 14, wherein the polypeptide is selected from the group consisting of MVA018L, Copenhagen C7L, Tian Tan TC7L, Bangladesh-1975
   D11L, India-1967 D8L, Garcia-1966 B14L, Brighton Red V028 or Zaire-96-I-16 D10L.
  - 16. The method of Claim 14, further comprising a second polypeptide comprising peptide 74A, immunogenic fragments or mutants thereof.
- 17. The method of Claim 14, wherein the immune response is induced by
  administering a product selected from the group consisting of a polypeptide, a
  naked nucleic acid molecule encoding the peptide or a nucleic acid molecule,
  encoding the peptide, in a suitable vector.
  - 18. The method of Claim 14, wherein 1 to about 4 amino acids can be substituted without essentially detracting from the immunological properties of peptide 165.
- 20 19. A method of identifying the presence of vaccinia or variola virus in a sample comprising determining whether T cells present in the sample become activated in the presence of a polypeptide selected from the group consisting of: peptide 74A (SEQ ID NO: 1), peptide 165 (SEQ ID N O: 2), an immunogenic mutant or

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fragment thereof and a combination thereof, wherein if the T cells become activated, then vaccinia or variola virus is present in the sample.

- 20. The method of Claim 19 wherein whether the T cells present in the sample become activated is determined using an assay selected from the group consisting of: a cytokine assay, a flow cytometry assay and a limiting dilution assay.
- 21. The method of Claim 20 wherein the assay is an ELISPOT assay or a tetramer staining assay.
- The method of Claim 19 wherein the sample is selected from the group consisting of: blood, lymph and tissue.
  - 23. The method of Claim 22 wherein the sample is a peripheral blood mononuclear cell sample.
- 24. A method of determining whether an individual has been infected with vaccinia or variola virus comprising determining whether the individual's T cells become activated in the presence of polypeptide selected from the group consisting of: peptide 74A (SEQ ID NO: 1), peptide 165 (SEQ ID NO: 2), an immunogenic mutant or fragment thereof and a combination thereof, and wherein if the individual's T cells become activated in the presence of the peptide, then the individual has been infected with vaccinia or variola virus.
- 20 25. The method of Claim 24 wherein the individual's T cells are present in a sample, and the sample is selected from the group consisting of: blood, lymph and tissue.

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- 26. The method of Claim 25 wherein the sample is a peripheral blood mononuclear cell sample.
- 27. The method of Claim24 wherein whether the whether the individual's T cells become activated is determined using an assay selected from the group consisting of: a cytokine assay, a flow cytometry assay and a limiting dilution assay.
- 28. The method of Claim 27 wherein the assay is an ELISPOT assay or a tetramer staining assay.
- 29. A method of monitoring the effectiveness of a vaccinia vaccine in an individual who has been administered the vaccinia vaccine, comprising determining whether the individual's T cells become activated in the presence of a polypeptide selected from the group consisting of: peptide 74A (SEQ ID NO: 1), peptide 165 (SEQ ID N O: 2), an immunogenic mutant or fragment thereof and a combination thereof, wherein if the individual's T cells become activated, then the vaccinia virus is effective in the individual.
  - 30. The method of Claim 29 wherein the individual's T cells of the individual are present in a sample, and the sample is selected from the group consisting of: blood, lymph and tissue.
- The method of Claim 30 wherein the sample is a peripheral blood mononuclear cell sample.
  - 32. The method of Claim 29 wherein whether the whether the individual's T cells become activated is determined using an assay selected from the group

consisting of: a cytokine assay, a flow cytometry assay and a limiting dilution assay.

- 33. The method of Claim 32 wherein whether the individual's T cells become activated is determined using an ELISPOT assay or a tetramer staining assay.
- 5 34. The method of Claim 29 wherein the vaccinia vaccine is a cancer vaccine.